

<b>Applicant Name</b>	Carbon Conservation District
<b>Project Name</b>	Planning Tools for Developing and Managing Water Resources Near Red Lodge: Phase 1, Hydrogeology and Water Balance of the East and West Bench Aquifers

### **Project Abstract**

This project will collect the data needed to develop a baseline understanding of the hydrogeology and water balance of the aquifers underlying the East and West benches of Rock Creek near Red Lodge. The project results will provide information to evaluate and manage the effects of climate, changes in irrigation practices, and changes in land use on groundwater quality and availability in the alluvial aquifers underlying this area. Residents of this rapidly growing part of Carbon County are dependent on groundwater in alluvial sand and gravel aquifers as the primary, if not the sole, source of water. This aquifer is recharged primarily by flood irrigation and ditch leakage. Decreases in recharge because of drought or changes in irrigation practices or land use will reduce groundwater availability. Additionally, the alluvial aquifer is shallow and vulnerable to contamination, but limited water quality data have been collected in the area.

Only limited groundwater information is available in this part of Carbon County. As part of a preliminary investigation, water levels were monitored in wells underlying the West Bench near Red Lodge. The Montana Bureau of Mines and Geology (MBMG) has recently collected additional data as part of a regional groundwater investigation of Stillwater and Carbon counties. These data sets are extremely valuable because they document background water-level trends and seasonal fluctuations. Unfortunately, the short period of record and limited frequency of measurements are not at the detail required to understand the surface water/groundwater relationships needed to make land-use and planning decisions. Acquiring enough surface and groundwater information to understand the hydrologic balance of these alluvial aquifers is essential for planning and management of this critical and increasingly scarce groundwater resource.

Proposed tasks for the project include conducting an inventory of wells, springs, irrigation ditches, and streams in the area. Dedicated test wells will be installed for measuring water-level fluctuations under different recharge scenarios and for conducting pumping tests to determine aquifer hydraulic properties. Most of the test wells will be located near suspected recharge areas (irrigated fields and irrigation ditches). Seepage runs will be conducted on many of the significant irrigation ditches to quantify irrigation losses, which are believed to be the primary source of recharge to the alluvial aquifer. Products of the project will include detailed maps of aquifer distribution and groundwater availability, groundwater flow, drilling depths, groundwater quality, and nitrate concentrations. The work will ultimately focus on developing a water balance of the alluvial aquifers underlying the East and West benches. A report will be prepared describing the activities and conclusions of the project. All data will be available through the MBMG's Ground-Water Information Center (GWIC) database. Public meetings will be conducted throughout the project to disseminate project information and to gain input and identify concerns.